Google Patents

Absorbent hygiene or care article comprising a proportion of at least one elemental or ionic heavy metal

Abstract

translated from German

Absorbent hygiene or care article having an absorption body with a proportion of superabsorbent polymers based on acrylates, said hygiene or care article also having a sheet-like component having a proportion of at least one elemental or ionic heavy metal.

Classifications

A61L15/18 Bandages, dressings or absorbent pads for physiological fluids such as urine or blood, e.g. sanitary towels, tampons containing inorganic materials

View 5 more classifications

Landscapes

Health & Medical Sciences

Chemical & Material Sciences

Show more

DE202012012936U1
Germany

Download PDF
Find Prior Art
Similar

Other languages: German

Current Assignee : BSN Medical GmbH

Worldwide applications

2012 • EP DE WO 2014 • US

Application DE202012012936.8U events

2012-02-22 • Priority claimed from DE201210101413

2012-08-22 • Application filed by Individual

2012-08-22 • Priority to DE202012012936.8U

2014-04-14 • Publication of DE202012012936U1

2022-08-23 • Anticipated expiration

Status • Expired - Lifetime

Info: Patent citations (21), Cited by (5), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, DPMA, Discuss

Claims (11)

Hide Dependent

translated from German

An absorbent sanitary or personal care article comprising an absorbent body having a proportion of acrylic-based superabsorbent polymers, said sanitary or personal care article further comprising a sheet-like component comprising a

proportion of at least one elemental or ionic heavy metal. Hygiene or care article according to claim 1, wherein the at least one elemental or ionic heavy metals is selected from the group consisting of copper, zinc and / or silver. Hygiene or care article according to one of the preceding claims, wherein the elemental or in ionic form heavy metals are applied by coating on a support material. Hygiene or care article according to one of the preceding claims, wherein the elemental or present in ionic heavy metals are incorporated by coextrusion in a carrier material. Hygiene or care article according to one of the preceding claims, wherein the elemental or present in ionic heavy metals are present in filament or Faserfom and - optionally processed with a further material to form a sheet-like material. Hygiene or care article according to one of the preceding claims, wherein the absorbent body in addition to a proportion of superabsorbent polymers having a nonwoven. Hygiene or care article according to one of the preceding claims, wherein said hygiene or care article at least partially has a liquid-permeable shell. Hygiene or care article according to one of the preceding claims, wherein the sheet-like component comprises a proportion of at least one elemental or ionic heavy metal a) is arranged inside the liquid-permeable casing b) forms an integral part of the shell, c) is applied to the exterior of the shell, and / or d) is present as a detached from the absorbent body component. Hygiene or care article according to one of the preceding claims, wherein the absorption body in plan view of its flat side has a surface (F1) which is in its non-wetted state by 3% to 75% smaller than the surface (F2) of the flattened sheath Hygiene or care article according to one of the preceding claims, wherein the shell has at least partially pores, which are smaller on average than the unwetted superabsorbent polymers. Hygiene or care article according to one of the preceding claims, wherein the sheath or the absorbent body punches, slots, incisions and / or recesses.

Description

translated from German

The present invention relates to an absorbent hygiene or care article comprising a proportion of at least one elemental or ionic heavy metal.

In hygiene and wound care, aggressive and resistant microorganisms are becoming increasingly common. Especially in chronic, poorly healing wounds, as z. B. are common in diabetics, infections play a major role. In the recent past, this problem has been aggravated by antibiotic-resistant pathogenic germs. In particular, multi-resistant germs such. B. Vancomycin-resistant enterococci, Methicillin-resistant Staphylococcus aureus and multi-resistant Pseudomonas aeruginosa play in clinical practice today often a fatal role.

In the United States, 90,000 ulcerated crural patients with diabetes are amputated each year because they can not be treated otherwise due to infectious complications from multi-drug resistant bacteria.

In the case of incontinence articles, in particular in diapers, there is the risk, however, that vancomycin-resistant enterococci in particular, which find ideal living conditions in such an article when it is used, multiply and, for. B. wounded skin areas of the person carrying the article. This is a real danger in particular because incontinence patients are often bedridden and z. B. have a decubitus (for example, in the rump area), which could form an extremely difficult to treat infection upon immigration of such resistant germs. Moreover, due to their sometimes long medical history, such patients are at risk of vancomycin-resistant enterococci in the digestive tract.

But also in other hygiene and / or wound care articles such. B. sanitary napkins, tampons, incontinence articles, diapers, hospital mats, stoma pouches, stoma pouches, floor mats, surgical drapes, redon bottles, tissues and / or hyperhidrosis items there is a risk that antibiotic-resistant pathogenic germs multiply due to the often favorable growth conditions in the same and a Represent danger of infection.

Absorbent hygiene or care articles are therefore known from the prior art, the heavy metals such. B. have silver. The EP1656914 The applicant of the present invention describes an absorbent body for absorbing liquid exudate emerging from the wounds, comprising inter alia a layer of a liquid-absorbent textile section with superabsorbent particles present therein and additionally an amount of an antimicrobial silver-containing substance incorporated into the material of the textile section or fabric the shell is introduced.

By the fact that according to EP1656914 the antimicrobial silver-containing substance is "introduced" into the

material of the textile section or the shell, can be set under certain circumstances, considerable production and procedural problems. Thus, the exact metered addition of the silver-containing substance in the material of the shell or textile section is not easy to accomplish. Care must also be taken to ensure that the silver-containing substance does not leave the material of the envelope or the textile section uncontrolled. Furthermore, it must be ensured that the silver-containing substance is provided in a sufficiently storable form.

The object of the present invention is therefore to provide an absorbent hygiene or care article, which does not have the disadvantages mentioned.

This object is achieved with the features of the independent claims. The subclaims indicate preferred embodiments.

Accordingly, an absorbent sanitary or personal care article comprising an absorbent body having a proportion of acrylic-based superabsorbent polymers is provided, said sanitary or personal care article further comprising a sheet-like component comprising a proportion of at least one elemental or ionic heavy metal.

Due to the feature that the at least one elemental or ionic heavy metal is provided in the form of a sheet-like component, there are considerable production and process engineering advantages, in particular with respect to the exact metered addition of the silver-containing substance in the material of the shell or the textile section is not easy to do, the controllability of the fate of the silver-containing substance and the sufficient shelf life.

All this can be done, for example, that the sheet-like component is obtained from a supplier who meets the above conditions manufacturing technology.

a) im Inneren einer flüssigkeitsdurchlässigen Hülle angeordnet sein,
b) einen integralen Bestanteil einer Hülle bildetn
c) auf das äußere einer Hülle aufgebracht sein, und/oder
d) als von dem Absorptionskörper losgelöste Komponente vorliegen.

Furthermore, a very high flexibility of the product design can be achieved in this way. Thus, said sheet-like component may comprise a proportion of at least one elemental or ionic heavy metal in the product according to the invention

a) be arranged inside a liquid-permeable casing,
b) form an integral part of a shell
c) be applied to the outside of a shell, and / or
d) as a component detached from the absorption body.

Said hygiene or care article is preferably an article selected from the group consisting of wound care articles, sanitary napkins, tampons, incontinence articles, diapers, medical underpads, ostomy pouches, stoma pouches, floor mats, surgical drapes, redon bottles, handkerchiefs and / or hyperhidrosis articles. Likewise, it may also be a care product, such. As an ointment, a pasty preparation, a gel or the like.

In the following, the term "wound care article" is intended in particular to designate a wound dressing, preferably a flat wound dressing or a wound care cloth intended for the human, dental and / or veterinary sector.

Said wound care article may preferably be in the form of a swab, a wound wipe, a wound dressing, a wound compress, a wound pad, an optionally elastic wrap, a bandage, a plaster or a stocking.

In particular, the term "wound care article" may also be understood as an ensemble of various products placed in a given arrangement on the wound to be treated. This ensemble can form a physical unit by the various products are combined in a common shell or - if necessary, without a shell - are adhesively bonded together. However, the ensemble may also be in the form of a kit in which the various products are optionally placed on the wound to be treated by means of a wrap, adhesive tape, adhesive tape or patch in the given arrangement.

Superabsorbent polymers (SAP) based on acrylates are plastics that are able to absorb many times their own

weight - up to 1000 times - in liquids. Chemically, these are, for example, copolymers of acrylic acid (propenoic acid, $C_3H_4O_2$) and sodium acrylate (sodium salt of acrylic acid, $NaC_3H_3O_2$), it being possible for the ratio of the two monomers to vary from one another. In addition, a so-called core crosslinker (core-crosslinker, CXL) is added to the monomer solution, which connects the long-chain polymer molecules formed in places with each other by chemical bridges (they "crosslinked"). These bridges make the polymer water insoluble. When water or aqueous salt solutions penetrate into the polymer particles, it swells up and tightens this network at the molecular level, so that the water can no longer escape without assistance. The superabsorbent polymers can be present in the hygiene or care article according to the invention in the form of a granulate, a powder, a bed, a compact, a foam, in the form of fibers, a Fasergewirkes, -laid or -fleece and / or a fiber wadding.

Alternatively, the superabsorbents may be based on methylacrylic acids, acrylamidopropanesulphonic acid copolymers, starch-acrylic acid graft polymers, vinyl acetate-acrylic acid ester copolymers, acrylonitrile or acrylamide copolymers.

Absorbent hygiene or care articles of the type mentioned are not known from the prior art. Although the use of silver in wound dressings in combination with foams, alginates, activated carbon, carboxymethyl cellulose or hydrocolloids is known, it is not known to be used with acrylate-based superabsorbent polymers. The following table lists uses known from the prior art: additional component product name Manufacturer foam Mepilex AG Mölnlycke Allevyn AG Smith & Nephew Biatain Ag Coloplast UrgoCell Silver Urgo Alginate dressings Algisite Ag Smith & Nephew Suprasorb AG Lohmann & Rauscher Askina Calgitrol Ag BROWN SeaSorb Ag Coloplast Acticoat Absorbent Smith & Nephew Melgisorb AG Mölnlycke SILVERCEL hydroalginate Systagenix Urgosorb Silver Urgo (with CMC) activated carbon ACTISORB Silver Systagenix Vliwaktiv AG Lohmann & Rauscher Carboxymethylcellulose (CMC) AQUACEL Ag ConvaTec Urgosorb Silver Urgo (with alginate) hydrocolloid Contreet Coloplast

Furthermore, the use of a sheet-like component comprising silver from the product Kalypto NPD 1000 is known. The latter is a wound dressing for vacuum wound care which has a pad backed with a silver-containing sheet made of a fiber material called superabsorbent. This material is a glycosidic polymer containing sodium glucosamine - not so superabsorbent polymer based on acrylates.

As the Applicant has pointed out in previous patent applications, unlike foams, alginates, activated carbon, carboxymethyl cellulose, hydrocolloids or glycosidic polymers containing sodium glucosamine, superabsorbent polymers are capable of absorbing and binding large quantities of exudate. They thus reduce the proportion of pathological exudate in the wound and thus promote wound healing.

However, in contrast to foams, alginates, activated carbon, carboxymethylcellulose or hydrocolloids, said superabsorbent polymers bind not only liquids but also bacteria, proteins and other biomolecules.

This effect ideally complements the antimicrobial and antiviral effect of elemental or ionic heavy metal. This is the case since studies have shown that heavy metals or heavy metal ions - especially those based on silver or copper - develop their antimicrobial and antiviral properties within a very short time. As a result, it can - especially when it comes to the microorganisms are bacteria - to a release of endotoxins and bacterial pathogenicity factors (especially bacterial hemolysin and leucocidin) come. These in turn can cause inflammation, allergies, shocks (especially anaphylactic shocks and / or the Toxic Shock Syndome) and fever (Herxheimer reaction). This is especially true when copper oxide is applied topically, z. B. in the form of a hygiene or care article in said form, for example, a wound dressing.

The hygiene or care article of the invention thus not only helps to reduce the number of pathogens in the wound by including the microorganisms in particular the bacteria by means of SAP and / or by lysis of the bacteria, but also actively absorbs the resulting lysates, and although in particular the endotoxins contained therein. The latter also contributes to relieving the immune system, which otherwise would have to handle and dispose of the resulting endotoxins.

- für Schwangere, die in der Regel nur mit einem sehr eingeschränkten Antibiotikaspektrum

(insbesondere Erythromycin) behandelt werden dürfen
• für Personen mit einer Antibiotikaallergie
• für Personen mit Leberschäden oder systemischen Defekten, bei denen bei einer Antibiotikatherapie eine metabolische Intoxikation zu befürchten ist

A further advantage of the hygiene or care article according to the invention is that it can not only be used for the treatment of wounds infected with antibiotic-resistant germs, but that it can also be used in cases in which antibiotic therapy is not indicated for other reasons , This is true for. B. too

• for pregnant women, who are usually only allowed to be treated with a very limited spectrum of antibiotics (especially erythromycin)
• for people with an antibiotic allergy
• for persons with liver damage or systemic defects who are likely to be affected by metabolic intoxication during antibiotic therapy

A further advantage of the hygiene or care article according to the invention is that it is particularly suitable for the treatment of burn wounds, which exude strongly on the one hand (which makes the use of SAP makes sense), on the other hand, or hardly blood supply, which complicates a systemic antibiotic therapy. However, burn wounds are extremely susceptible to infections, especially for the multidrug-resistant germs commonly found in hospitals, so that treatment with copper or copper ions represents a new, promising option.

Another advantage of the hygiene or care article according to the invention lies in a synergistic reduction of the inflammation-related odor, as is often found in chronic wounds. The activity of the copper or the copper ions reduces the metabolic activity of the bacteria, which in particular releases butyric acid, responsible for the formation of odors. At the same time, the superabsorbent polymers absorb both already formed odorants and exudate and water from the wound and bind them. By draining the winds, moreover, the growth conditions for the odoriferous bacteria are worsened, resulting in further odor reduction.

It is also particularly advantageous that a colloid comprising heavy metals in elementary or ionic form can be formed by the wound fluid taken up by the SAP.

This advantageous formation of a colloid is surprising because the SAPs are known to bind exudate so effectively that there should not actually be any fluid to form the colloid. Apparently, however, the gelation of superabsorbent polymers is sufficient to allow Kollidbildung. This implicit and surprising type of colloid formation has given to deliberately added colloids z. As in the form of ointments that are applied to the hygiene or care article of the invention, the advantage that the production can be done much more efficient and cost-effective.

The superabsorbent polymers can be present in the hygiene or care article according to the invention in the form of a granulate, a powder, a bed, a compact, a foam, in the form of fibers, a Fasergewirkes, -laid or -fleece and / or a fiber wadding.

The superabsorbent particles can be present in powder or granular form with a particle size between 100 μm and about 1000 μm.

From the EP1656914 Applicant of the present application is a disposable absorbent body for absorbing wound exudate from the wound, comprising a liquid-permeable, two-sidewall shell and at least one layer of liquid-absorbent fabric section having superabsorbent particles therein contained in the shell , known. In this case, the absorption body has a quantity of an antimicrobial silver-containing substance which is introduced into the material of the textile section or the sheath.

The EP1656914 does not disclose that the silver-containing substance is present in a sheet-like component. However, the embodiment according to the invention according to which the hygiene or care article has a web-like constituent comprising a proportion of at least one elemental or ionic heavy metal, preferably silver or copper, has considerable advantages in terms of production and application. Thus, the production and

distribution is cheaper and more flexible, since the sheet-like component can be integrated as a prefabricated supply product easier in the hygiene or care article or can be delivered together with the Absorbtionskörper as a kit. Furthermore, there is the possibility to use the sheet-like component as a primary dressing in the context of the hygiene or care article of the invention.

In particular, the web-shaped embodiment makes it possible for it to be integrated into the casing of the hygiene or care article according to the invention, which in turn makes possible an arrangement that is as close to the wound as possible.

It is preferably provided that the at least one elemental or ionic heavy metal is selected from the group comprising copper, zinc and / or silver.

In addition to the heavy metals present in elemental form, these definitions generally also include their salts, preferably their chlorides, sulfates, sulfides, sulfites or nitrates, their organometallic compounds or their sulfonamide compounds (such as silver sulfadiazine).

The antimicrobial properties of silver or silver ions are known to the person skilled in the art and need not be discussed further here.

1) Da sie hoch redoxaktive Metallionen darstellen, fördern sie die Peroxidation von Membranlipiden und beschädigen dadurch die Zellwand des Mikroorganismus. In dieser Eigenschaft bewirkten sie zudem eine Verschiebung der essentiellen Metalle von ihren ursprünglichen Bindungszentren und stören so den Stoffwechsel des Mikroorganismus.
2) Sie beschädigen das genetische Material des Mikroorganismus, indem sie die DNA binden und somit ihre Konformation ändern
3) Die beschädigen die Proteine des Mikroorganismus, insbesondere bewirken sie einen Abbau von Sulfhydrylgruppen sowie eine Oxidation bestimmter Aminosäurereste.
4) Sie beeinträchtigen die oxidativen Phosphorylierung und stören das osmotischen Gleichgewicht.

Copper or copper ions deactivate or kill a broad spectrum of viruses and microorganisms most efficiently. In this case, copper or the copper ions acts in different ways.

1) Since they are highly redox-active metal ions, they promote the peroxidation of membrane lipids and thereby damage the cell wall of the microorganism. In this capacity, they also caused a shift of the essential metals from their original binding centers and thus disrupt the metabolism of the microorganism.
2) They damage the genetic material of the microorganism by binding the DNA and thus changing its conformation
3) damage the proteins of the microorganism, in particular they cause degradation of sulfhydryl groups and oxidation of certain amino acid residues.
4) They impair the oxidative phosphorylation and disturb the osmotic balance.

In addition, copper or copper ions influences the different biological defense mechanisms of the microorganism in such a way that resistance to antimicrobial agents is practically no longer present. Incidentally, the same applies to zinc.

- Chemische Gasphasenabscheidung (CVD)
- Flammenbeschichtung (C-CVD)
- Physikalische Gasphasenabscheidung (PVD) Plasmagestützte Chemische Gasphasenabscheidung (PECVD) Rotationsbeschichtung (spin coating)
- Spritzen
- Tauchbeschichten (Dipcoating)
- Vakuumverdampfen
- Sputtern

It is furthermore preferably provided that the elemental or ionic heavy metals are applied by coating to a carrier material. The carrier material may be, for example, a film, a granulate, a fiber or a yarn. Preferred coating methods are, for example:

- chemical vapor deposition (CVD)
Flame coating (C-CVD)
- Physical Vapor Deposition (PVD) Plasma-assisted Chemical Vapor Deposition (PECVD) Spin Coating
- spraying
- Dipcoating
- Vacuum evaporation
- sputtering

The person skilled in the common methods are known, and he is therefore able to apply without further inventive step, the above-mentioned method for coating the primary dressing according to the invention with elemental or ionic heavy metals.

Correspondingly silver-coated materials are known, for example, from the applications US6861570, US6087549, US7005556, US7214847, and US7230153. However, at no point do they mention the synergistic benefits associated with superabsorbent polymers.

The coated film or fiber or coated granules or yarn is then further processed into said sheet-like component. In the case of granules, this can be done for example by extrusion, in the case of the fiber or the yarn by spinning and then felting, weaving, knitting or knitting.

Furthermore, it is preferably provided that the elemental or ionic heavy metals are incorporated by coextrusion in a carrier material.

In this case, the elemental or in ionic form of the present shear metals, for example in the form of colloids, in the form of salts (preferably as chloride, sulfate or nitrate) or in the form of organometallic compounds in the extrusion process can be introduced.

It is further preferred that the heavy metals present in the elementary or ionic form are present in filament or fiber form and, if appropriate, are processed with a further material to form a sheet-like material.

This is especially intended for spinning and subsequent felting, weaving, knitting or knitting. This may possibly in combination with other fibers or yarns, such as. As polyester, polyamide, elastic yarns, etc. take place.

In addition, the at least one elemental or ionic heavy metal may be supplemented by calcium phosphate (for example in the form of calcium phosphate nanoparticles coated with silver, zinc or copper). The combination of one of the three heavy metals with calcium phosphate is up to 1000 times more deadly than conventional silver preparations for many germs. A crucial factor seems to be that bacteria use the carrier calcium for their metabolism. The 20 to 50 nanometer calcium phosphate particles are taken up by the microorganisms as food and thereby decomposed. Thousands of 1 to 2 nanometer small silver particles are released and unfold their bacteriostatic effect.

It is further preferred that the absorption body comprises a nonwoven in addition to a proportion of superabsorbent polymers.

The absorbent body may preferably comprise a substantially flat absorbent body of absorbent material consisting of an absorbent web having superabsorbent polymers dispersed therein. These may be in the form of a granulate, a powder, a bed, a compact, a foam, in the form of fibers, a Fasergewirkeses, -laid or -fleece and / or a fiber wadding.

In this case, the absorbent body has at least one material which is selected from the group comprising a mat, in particular an airlaid of said yarns or fibers of superabsorbent polymers with incorporated superabsorbent polymers, and / or a loose filling of superabsorbent polymers. Said Airlaid mat may preferably have a

substantially flat material portion of absorbent material, the z. B. consists of an absorbent fleece of said fibers with superabsorbent polymers distributed therein.

This absorbent body may correspond to the absorbent pad which is contained in a wound dressing of the applicant of the present invention, as described, for example, in US Pat WO03094813 , of the WO2007051599 and the WO0152780 and sold under the trade name "sorbion sachet". The disclosure of the said writings is fully attached to the disclosure of this document.

In another embodiment, the absorbent body can also form a core which - possibly flake-like - fibers or yarns of superabsorbent polymers and superabsorbent polymers in granular form, wherein the granules are glued or welded to the fibers or yarns in several heights, and the granules are distributed over more than 50% of the total height of at least a portion of the core, wherein there are mixed areas of granules and fibers. The proportion by weight of the superabsorbent polymers may preferably be in the range between 10-25% by weight. Similar constructions are known from conventional incontinence materials and known as sanitary napkins for their cushioning properties. Around this core around a shell may be arranged, which is arranged overlapping in areas, and the z. B. an adhesive seam covered or part thereof.

The absorption body particularly preferably has a fleece, preferably a nonwoven or airlaid, which consists of superabsorbent fibers ("SAF", preferably polyacrylates) or contains these as constituent. The fibers can be mixed, for example, with fluff pulp (cellulose) or with polyester fibers. Alternatively or additionally, a layer structure may be provided.

The absorbent body in another embodiment may also comprise at least one flat layer comprising fibers or yarns of superabsorbent polymers, to which superabsorbent polymers Polymers are glued in granular form. This results in a preferred embodiment, a structure of the body having at least two layers, wherein at least one cover layer underlays a layer having superabsorbent polymers. Optionally, a second, flanking cover layer may be provided.

In another embodiment, the absorption body may have at least one cover layer of a sheet-like material, preferably a nonwoven material, onto which superabsorbent polymers in pasty or amorphous form are applied, preferably with an adjuvant. This also results in a structure of the body having at least two layers, wherein at least one cover layer underlays a layer having superabsorbent polymers. In this case, very high proportions by weight of superabsorbent polymers can be achieved. Optionally, a second, flanking cover layer may be provided.

In the two aforementioned embodiments, there are no mixtures of fibers and superabsorbent polymers in the plane; but only fixed announcements of both materials. The optionally provided multiple layers can be physically compacted together by rolling, pressing, calendering or similar processes in a preferred embodiment.

It is particularly preferred that the absorbent body in its construction corresponds approximately to the commercially available products "sorbion sachet", "Tenderwet", "Zetuvit", "Drymax", "Vliwasorb" and / or "Curea P".

Furthermore, it is preferred that said hygiene or care article at least partially has a liquid-permeable shell.

The latter surrounds the absorbent body, forms a barrier against solid precipitates, and allows the passage of other leaked substances to the material portion of absorbent material disposed within the sleeve. The sheath is preferably at least partially closed by a seam

The pores or meshes of the shell are preferably 0.05 mm to 1.0 mm, preferably 0.20 mm to 0.50 mm in size. In principle, it may be provided that the average pore size is smaller than the average size of the particles containing hydroactive polymers. Furthermore, it can preferably be provided that the pores or meshes are delimited by the filament or fiber sections, which are approximately arcuate in section through the envelope and point outwards with their arc crests.

The envelope is preferably made of woven or non-woven composite synthetic fibers, such as polypropylene or polyethylene fibers, but also cotton, silk or viscose. The sheath is preferably made of a fabric or nonwoven

having at least a surface specific weight of 20 g / m ^{2} .

Preferably, the shell is made of hydrophobic material, or the shell material is hydrophobic equipped. The hydrophobic properties of the sheath prevent it from sticking to the wound surface and help the wound exudate particles to enter the sheath more quickly.

It can be provided that the shell has at least partially an elastic material, such. As fibers of Lycra or elastane. This also ensures that the material portion can increase in fluid intake in its volume and is not limited by the shell.

Absorptionskorper said type are for example in the WO03094813 , of the WO2007051599 and the WO0152780 disclosed by the assignee of the present invention.

The material of the sheath may be structured such that the sheath has a rough inner surface and a smooth outer surface. Preferably, the rough inner surface of the shell is formed by funnel-shaped perforations, each tapering in the direction of the inner surface and terminate in a free opening edge ("projection"). This rough inner surface counteracts the displacements of the contents of the shell, so that can be dispensed with a fixation with adhesive dots. Accordingly, the smooth outer surface of the sheath material may be formed by curved, between the perforations extending material portions. Such a shell material can be referred to as "three-dimensional" in contrast to a two-sided plane, and is made of z. B. from the DE 10 2006 017 194 the applicant of the present application, the disclosure content of which is fully referenced here.

Particularly preferably, it is provided that said three-dimensional shell material is laminated to the aforementioned polypropylene nonwoven. Such a design results in improved fluid absorption properties.

It can also be provided that the hygiene or care article on its side facing away from the wound has a liquid-impermeable protection against wear ("backsheet").

a) im Inneren der flüssigkeitsdurchlässigen Hülle angeordnet ist
b) einen integralen Bestanteil der Hülle bildet,
c) auf das äußere der Hülle aufgebracht ist, und/oder
d) als von dem Absorptionskörper losgelöste Komponente vorliegt

Furthermore, it is preferred that the hygiene or care article according to one of the preceding claims, wherein said web-shaped constituent comprises a proportion of at least one elemental or ionic heavy metal

a) is arranged inside the liquid-permeable casing
b) forms an integral part of the shell,
c) is applied to the exterior of the shell, and / or
d) is present as a detached from the absorbent body component

In the latter case, the hygiene or care article of the invention is a kit that consists of a possibly coated absorbent body and a detached therefrom web-shaped component comprising a proportion of at least one elemental or in ionic form heavy metal.

Both components may be present in a packaging (if necessary a sterile packaging) or in two separate, but jointly delivered or intended for joint use packaging (if necessary sterile packaging).

In the case where the sheet-like component is present as a component detached from the absorbent body, the sheet-like component can be used like a primary dressing, which is first placed on the wound, and then in a second step put on the optionally coated absorbent body.

Particularly preferably, the absorption body in plan view of its flat side has a surface (F1) which in its non-wetted state is 3% to 75% smaller than the surface (F2) of the flattened casing and freely movable or fixed in the casing, wherein the shell at least partially has pores which are smaller on average than the unwetted superabsorbent polymers.

In this way it is ensured that the material portion can increase in fluid intake in its volume and is not limited by the shell.

Particularly preferred is provided that the shell in plan view of its flat side has a circumferential, projecting beyond the seam top and the absorbent body is free of hard, sharp edges and corners.

Particularly preferably, said hygiene or care article has a surface mass of 5 × 10, 5 × 20, 10 × 20, 10 × 10, 10 × 15 or 15 × 15 cm.

The basis weight may be in the range between ≥ 50 and ≤ 2000 g / m ^{2} . Area weights of 50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 650, 700, 750, 800, 850, 900, 950, 1000, 1050, 1100, 1150 are preferred , 1200, 1250, 1300, 1350, 1400, 1450, 1500, 1550, 1600, 1650, 1700, 1750, 1800, 1850, 1900, 1950, and / or 2000 each +/- 25 g / m ^{2} provided.

The thickness can be in the range between ≥ 2 and ≤ 50 mm. Preferred are thicknesses of 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46 , 48, and / or 50 are each provided +/- 1 mm.

The absorption capacity can be in the range between ≥ 3 and ≤ 30 ml 0.9% saline / m ^{2} at 0.2 psi pressure. Values of 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 are preferred. 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, and / or 30 ml of 0.9% saline / m ^{2} provided. Alternatively, the absorption capacity can be in the range between ≥ 2 and ≦ 50 g water / g. Values of 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 are preferred , 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49 , and / or 50 g of water / g

The total content of superabsorbent polymers can be in the range between ≥ 5 and ≦ 100% w / w. Values of 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 are preferred , 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49 , 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74 , 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99 and / or 100% w / w.

The tensile strength can be in the range between ≥ 5 and ≦ 80 N / 5 cm. Values of 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27 are preferred , 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52 , 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77 , 78, 79 and / or 80 N / 5 cm.

The extensibility can be in the range between> 10 and <80%. Values of 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32 are preferred , 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57 , 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79 and / or 80%.

When using superabsorbent fibers, the following types have been found to be particularly advantageous in practice: Type 1 2 3 4 5 6 Structure 1 Layer construction: Thermo bonded airlaid with laminated nonwoven 40% polyester short cut fiber; 60% SAF Bicomponent fiber of SAF and a thermoplastic Layer construction: Thermo bonded airlaid with laminated nonwoven 25% polyester; 75% SAF 40% polyester short cut fiber; 60% SAF Structure 2 Bicomponent fiber of SAF and a thermoplastic + fluff-pilp needle felting Carded, thermobonded nonwoven Bicomponent fiber of SAF and a thermoplastic + fluff-pilp needle felting needle felting Type of SAF fiber 101/6/10 102/52/10 102/52/10 101/6/10 Weight (g / m ^{2}) 560 540 1000 350 150 380 Thickness (mm) 6 5.4 20 3.5 2.4 3.8 capacity 31.2 l of water / m ^{2} > 20 g of water / g > 16 g water / g or 16000 g water / m ^{2} 19.51 water / m ^{2} > 25 g 0.9% common salt / g > 17 g of water / g or 6400 g / m ^{2} Capacity under pressure (ml 0.9% saline / m ^{2} at 0.2 psi pressure) 16 16 Total content of superabsorbent polymers (% w / w) 18 40 50 18 75 60 Tensile strength (N / 5 cm) 16 ± 13 16 ± 13 Extensibility (%) 60 ± 18 60 ± 18

Similar preferred parameter ranges apply as mentioned above. The fluid retention can be between ≥ 5 and ≤ 100

g / g. Values of 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 are preferred , 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49 , 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74 , 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99 and / or 100 g / g

In practice, the following types have proven to be particularly advantageous: Type 1 2 3 4 5 6 7 8th Weight (g / m^2) 450 300 150 50 100 120 140 440 Thickness (mm) 1.3 1.2 0.9 0.7 0.7 0.76 1 1.2 Fluid retention (g / g) 28 33 28 15 25 28 11.5 38 Tensile strength (N / 5 cm) 25 55 20 20 20 20 15 20 Absorption capacity (g / g) 45 20 50 20 40 50 28 55

Furthermore, it is preferably provided that the sheath or the absorption body have punches, slots, incisions and / or recesses.

These are preferably designed and / or arranged in such a way that they facilitate the liquid entry into and the liquid intake through the wound care article - which is advantageous in particular because of the high endotoxin burden of the exudate caused by the heavy metals.

It is further particularly preferred that said absorbent body has, in addition to a layer of superabsorbent polymers, at least one second flanking layer which has fewer or no superabsorbent polymers and extends in terms of area beyond the former. In this way, it is ensured that the layer comprising superabsorbent polymers can gain volume in accordance with the liquid uptake, without the volume increase being recognizable to the outside, since the latter is laminated by the second layer.

In a further preferred embodiment, hygiene or care article further comprises a wound spacer grid.

The term "wound distance grid", a lattice or gauzy structure that - often as a so-called "primary dressing" - is applied directly to a wound before, if necessary, a secondary dressing is applied. Wound distance screens are often referred to as "wound gaits" and serve primarily to prevent sticking of the entire wound dressing with the wound. For this purpose, wound spacer mesh are made of a material or coated with a material that reduces or prevents adhesion to the wound. Alternatively, the geometry of the wound distance grid can also be designed such that adhesion to the wound is reduced or prevented.

Commercially available examples of wound spacer meshes are e.g. B. the products "Mepitel" (silicone-coated, elastic polyamide mesh), "Physiotulle", "Urgotül" (network of polyester fibers soaked with hydrocolloid particles and Vaseline) and "ADAPTIC" (smooth viscose knit, impregnated with an oil-in-water emulsion) ,

The aforementioned products are two-dimensional wound spacer meshes, which therefore essentially take the form of a gauze or a mesh. A three-dimensional wound distance grid is known under the name "sorbion plus" and especially in the EP2004116 the assignee of the present invention, the contents of which are fully incorporated herein by reference.

Such a three-dimensional wound spacer grid has a liquid-permeable, pliable material section made of a thermoplastic, which has a first, smooth surface, a surface facing away from the smooth surface and a second rough surface. The latter is produced by a multiplicity of three-dimensional perforations, the walls of which protrude from the first, smooth surface and each run out into a free-edge edge projection, giving the second surface a rough grip.

The perforations are made by punching inserted on one side. This creates a rough side with overhangs and a more or less smooth side.

A wound distance grid reliably prevents sticking of the hygiene or care article to the wound and wound edge maceration. Therefore, unlike the foams known from the prior art, the said active element no longer has to be tailored to the shape of the wound, which considerably reduces the workload of the medical staff.

Furthermore, at least one hygiene or care article preferably has a sheath, which in turn has means that are designed and / or selected such that the sheath is at least partially targeted by a volume increase of the

absorption body caused by fluid intake. In principle, such a behavior can be achieved with unidirectionally elastic material, that is to say a material which can be stretched in one direction, but not in the direction orthogonal thereto.

Furthermore, it is preferably provided that at least one wind care article comprises a composition containing at least one nutritive, at least one disinfecting or decontaminating and / or at least one protease inhibiting active substance and / or active substance complex for the external supply and / or treatment of wounds of the human or animal body having.

Furthermore, the invention provides the use of a hygiene or care article according to one of the preceding claims in a vacuum wound care system.

Such systems are for. B. in the writings DE 20 2004 017 052 . WO2006048246 and DE 20 2004 018 245 The applicant of the present invention discloses the disclosure content of the present invention to be considered as belonging.

From the former, there is known an under-pressure wound-treating apparatus comprising a gas-tight wound-covering member constituting, in the state applied to the patient's body, a space remaining between the respective wound and the wound-covering member, and at least one terminal in contact with the space and by means of which the air in the room can be evacuated, the wound covering element being underlaid by at least one planar wound dressing receiving the wound exudate, the volume of which increases in the course of the absorption process, so that the absorbed wound exudates within the wound dressing and thus below the wound covering element Removal of the wound dressing from the body of the patient remain, the wound dressing is at least one layer of a superabsorbent enriched textile section, which is surrounded by a liquid-permeable shell, and the situation in plan view of ih flat side has an area that is 3% to 90% smaller than that of the sheath, so that the wound dressing can approach a circular shape in the vicinity of its entire filling capacity in cross-section.

From the second mentioned a multi-component dressing for wound treatment of the human or animal body using negative pressure is known, comprising:
a wound covering element for attachment to the skin and mucous membrane surface, at least one connection point which is in contact with the wound space and via which the substances located in the wound space can be evacuated, this having superabsorbent polymers, wherein the absorbed wound exudates bound to polymers in the wound space up to the Removal from the wound space remain, the polymers support by their binding capacity mutual synergies with the subatmospheric pressures.

From the latter, a drainage device for wound treatment using negative pressure is known, comprising a gas-tight, sheet-like material wound covering element which is adhesively attached to the skin surface around the wound area in the body applied to the patient and one between the respective wound and the wound covering element remaining, sealed space forms, at least one drainage tube, which can be used in the space over which the substances in the room can be evacuated, and at least one disposed within the room, the wound exudates absorbing wound dressing, the at least one layer of enriched with superabsorbent textile section which is surrounded by a liquid-permeable sheath, the absorbed wound exudates remaining within the wound dressing and thus below the wound-covering element until removal of the wound dressing from the body of the patient and wherein the wound covering element has a gas-tight sealable treatment opening through which the wound dressing can be inserted into the room and removed from the room.

The hygiene or care article of the invention may also have a shape adapted to anatomical conditions. For this purpose he can z. B. be formed in the form of a cuff; the above the one arm or a leg or a joint can be slipped, or in the form of an adapted to the heel, the elbow joint or the like Association.

In this case, a combination with microfibers proves to be particularly advantageous because microfibers due to their cushioning effect pleasantly cushion the mask of the overlying vacuum system. In addition, due to their moisture-conducting properties, microfibers particularly effectively support the drainage process. Particularly advantageous is the use of a spacer knitted fabric, knitted fabric or scrim having microfibers as described above.

Thus, for example, a vacuum system for joint-near attachment, for example for attachment to the elbow or heel conceivable as it is from the company KCI, San Antonio USA, on the market, the polyurethane foam used in this product by the inventive microfiber with cushioning Effect is replaced. The replacement of the known polyurethane foam by the microfiber according to the invention represents a cost-effective alternative to the known material and also provides over the structure of the polyurethane foam a more targeted deriving the wound fluids by a directed embodiment of the microfibers According to the invention, the use of a hygiene or hygiene as described above Care article intended for the control of exudate, the upholstery of a wound and / or the destruction of a biofilm.

The invention also includes the use of a hygiene or care article as described above or a kit for the treatment of chronic, acute and / or bleeding wounds, burn wounds and / or traumatically generated wounds, as well as the use of a hygiene or care article or a kit as described above intended for surgical or postoperative care or for military purposes.

Further provided is a method for treating wounds, in particular chronic wounds, comprising the use of a kit or a hygiene or care article as described above.

QUOTES INCLUDE IN THE DESCRIPTION

This list of the documents listed by the applicant has been generated automatically and is included solely for the better information of the reader. The list is not part of the German patent or utility model application. The DPMA assumes no liability for any errors or omissions.

Cited patent literature

EP 1656914 **[0006, 0007, 0033, 0034]**
WO 03094813 **[0053, 0066]**
WO 2007051599 **[0053, 0066]**
WO 0152780 **[0053, 0066]**
DE 102006017794 **[0067]**
EP 2004116 **[0093]**
DE 202004017052 **[0100]**
WO 2006048246 **[0100]**
DE 202004018245 **[0100]**

Patent Citations (21)

Publication number	Priority date	Publication date	Assignee	Title
WO2001052780A1	2000-01-19	2001-07-26	Riesinger, Birgit	Absorbent bodies for applying to skin and mucusa surfaces
WO2003094813A1	2002-05-08	2003-11-20	Birgit Riesinger	Absorption body for attachment to the human body
DE202004017052U1	2004-11-02	2005-06-09	Riesinger, Birgit	Device for wound treatment using negative pressure
DE202004018245U1	2004-11-24	2005-07-07	Riesinger, Birgit	Drainage device for treating wounds using reduced pressure has absorption body with layer(s) of textile section enriched with super-absorbents enclosed by liquid transmissive sleeve; absorbed wound secretions remain in absorption body
EP1656914A1	2004-11-10	2006-05-17	Birgit Riesinger	One way absorbent for absorbing liquid exudate from wounds

Publication number	Priority date	Publication date	Assignee	Title
WO2007051599A1	2005-11-02	2007-05-10	Birgit Riesinger	Absorptive element to be mounted on human or animal skin surfaces
DE102006017194A1	2006-04-12	2007-10-25	Birgit Riesinger	primary dressing
Family To Family Citations				
US4728323A *	1986-07-24	1988-03-01	Minnesota Mining And Manufacturing Company	Antimicrobial wound dressings
CA2011670A1 *	1989-03-20	1990-09-20	Diane L. Furio	Absorbent structures with odor control
US7214847B1	1997-09-22	2007-05-08	Argentum Medical, L.L.C.	Multilayer conductive appliance having wound healing and analgesic properties
US6087549A	1997-09-22	2000-07-11	Argentum International	Multilayer laminate wound dressing
US5814094A	1996-03-28	1998-09-29	Becker; Robert O.	Iontopheretic system for stimulation of tissue healing and regeneration
US6861570B1	1997-09-22	2005-03-01	A. Bart Flick	Multilayer conductive appliance having wound healing and analgesic properties
DE10328261B4 *	2003-06-23	2007-10-25	Beiersdorf Ag	Disinfecting coating with silver coating and its use
US7470266B2 *	2003-09-16	2008-12-30	I-Flow Corporation	Fluid medication delivery device
ATE401100T1 *	2003-10-30	2008-08-15	Mcneil Ppc Inc	ABSORBENT ITEMS WITH METAL-LOADED NANOPARTICLES
US8857440B2 *	2004-06-22	2014-10-14	DePuy Synthes Products, LLC	Devices and methods for protecting tissue at a surgical site
US20090227930A1 *	2004-07-15	2009-09-10	Crisp William E	Hygiene materials and absorbents
WO2007067111A1 *	2005-12-09	2007-06-14	Sca Hygiene Procucts Ab	Absorbent product
DE102006047041A1 *	2006-10-02	2008-04-10	Birgit Riesinger	Areal absorbent body
EP2179749B1 *	2008-10-23	2012-08-08	Paul Hartmann AG	Polyurethane gel foams

* Cited by examiner, † Cited by third party

Cited By (5)

Publication number	Priority date	Publication date	Assignee	Title
DE202020103112U1	2020-05-29	2020-06-10	Ingo Gottwald	Breathing air air filter device
WO2022002811A3 *	2020-06-28	2022-02-24	Innomotion AG	Sterile device for covering human skin and method for producing a sterile device
Family To Family Citations				
CN105813660B *	2013-08-12	2023-06-23	Bsn医疗有限公司	Wound care article with superabsorbent fibers and superabsorbent particles
EP3811915B1 *	2019-10-18	2023-11-15	L'Arcobaleno Claudia Chiello & Carsten Krahnert GbR	Composite bodies, use of a composite body and set with components of a plurality of composite bodies
US11596559B2 *	2019-11-08	2023-03-07	Small Healthy Environment Limited	System of pantiliners and menstrual pads

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
EP2747792B1	2018-04-25	Wound dressing having a content of copper or copper ions
EP2809363B1	2022-06-22	Wound care article comprising at least one surface having abrasive properties
EP2379033B1	2013-09-18	Wound dressing
EP2996650B1	2024-09-04	Wound care device for treating wounds by means of subatmospheric pressure, having openable window
EP2481385B1	2014-10-01	Wound care article having an absorbent shell
WO2009019227A2	2009-02-12	Wound care article having superabsorbent polymers in fiber and/or thread form
EP2787944A1	2014-10-15	Set comprising wound dressing and wound filler
WO2009019229A2	2009-02-12	Wound care article having at least one layer comprising superabsorbent polymers, and a layer comprising a soft foam material
EP2320844A1	2011-05-18	Wound care article, comprising a portion of modified natural fibers or synthetic fibers
EP2943171A1	2015-11-18	Liquid-permeable primary dressing with a silicone coating

Publication	Publication Date	Title
EP2153807A1	2010-02-17	Wound treatment item with textile bands with fibres and structural characteristics and fibres with non-structured characteristics
DE202012101743U1	2012-08-06	Wound care
EP2451498A1	2012-05-16	Device for the vacuum therapy of wounds
JP2017532178A	2017-11-02	Wound dressing tool
DE102012100842A1	2013-08-14	Wound care article useful e.g. for treating bleeding wounds, comprises surface having abrasive properties, which is designed such that wound care article is suitable for breaking bio-films in a wound, and/or for controlling wound exudation
DE102007049430A1	2009-04-16	Wound care article for kit for treating chronic wounds, acute bleeding wounds, traumatic wounds and for surgical or post surgical care or military-medical wound care, comprises supporting fibers, for providing integrity to the dressing
DE202012012936U1	2014-04-14	Absorbent hygiene or care article comprising a proportion of at least one elemental or ionic heavy metal
DE102007063294A1	2009-07-02	Wound dressing for use in kit for acute, emergency, military medical or chronic supply unit and for controlling exudate, treating chronic, acute, bleeding wounds, burn wounds or traumatic wounds, comprises wound exudate absorbing body
DE60309425T2	2007-10-04	Alginate tissue and superabsorbent wound dressing
WO2012160217A1	2012-11-29	Functionalized wound dressing
DE102007049428A1	2009-04-16	Wound care article for use with kit for treatment of chronic wounds, acutely bleeding wounds, traumatically produced wounds and for military-medical wound treatment, has layer of superabsorbent polymers, and layer of soft foam material
AT13770U1	2014-08-15	Absorbent hygiene or care article comprising a web-shaped component with a proportion of at least one elemental or present in ionic heavy metal
DE102012101413A1	2013-08-22	Cover i.e. coating, for securing e.g. sore care articles, in lower-pressure wound care system in e.g. medicinal sector, has strip-shaped section and mounting section for securing hygiene or body care articles with assistance of cover
WO2013026883A1	2013-02-28	Cover for a hygiene or care article
DE202012102259U1	2012-07-12	Cover for a hygiene or care article

Priority And Related Applications

Priority Applications (1)

Application	Priority date	Filing date	Title

Application	Priority date	Filing date	Title
DE202012012936.8U	2011-08-23	2012-08-22	Absorbent hygiene or care article comprising a proportion of at least one elemental or ionic heavy metal

Applications Claiming Priority (9)

Application	Filing date	Title
DE102011052941.1	2011-08-23	
DE102011052941	2011-08-23	
DE102011056429	2011-12-14	
DE102011056429.2	2011-12-14	
DE201210101413	2012-02-22	Cover i.e. coating, for securing e.g. sore care articles, in lower-pressure wound care system in e.g. medicinal sector, has strip-shaped section and mounting section for securing hygiene or body care articles with assistance of cover
DE102012101413.2	2012-02-22	
DE102012101559	2012-02-27	
DE102012101559.7	2012-02-27	
DE202012012936.8U	2012-08-22	Absorbent hygiene or care article comprising a proportion of at least one elemental or ionic heavy metal

Legal Events

Date	Code	Title	Description
2014-05-22	R207	Utility model specification	**Effective date** 20140522
2015-08-28	R081	Change of applicant/patentee	**Owner name**: MEDICAL GM DE **Free format t** FORMER OWI RIESINGER, B 48149 MUENS DE
2015-08-28	R082	Change of representative	**Representati name**: MICHA HUETTERMAI PARTNER PATENTANW/ DE **Representati**

Date	Code	Title	Description
			name: JOSTA PATENTANW/ AG, DE
2015-09-02	R150	Utility model maintained after payment of first maintenance fee after three years	
2016-01-04	R082	Change of representative	**Representati name**: JOSTA PATENTANW/ AG, DE
2019-03-01	R157	Lapse of ip right after 6 years	

Concepts

machine-extracted

Download Filter table

Name				Image	Sections	Count	Query match
absorbent	title,claims,abstract,description	38	0.000				
absorbent	title,claims,abstract,description	36	0.000				
heavy metal	title,claims,abstract,description	29	0.000				
superabsorbent polymer	claims,abstract,description	42	0.000				
superabsorbent polymers (SAPs)	claims,abstract,description	41	0.000				
absorption reaction	claims,abstract,description	15	0.000				
material	claims,description	36	0.000				
silver	claims,description	27	0.000				
silver	claims,description	27	0.000				
Copper	claims,description	10	0.000				
copper	claims,description	10	0.000				
copper	claims,description	9	0.000				
acrylic acid group	claims,description	6	0.000				
coating method	claims,description	5	0.000				
porous material	claims,description	5	0.000				

Name				Image	Sections	Count	Query match
Zinc	claims,description	4	0.000				
carrier material	claims,description	4	0.000				
coating agent	claims,description	4	0.000				
zinc	claims,description	4	0.000				
zinc	claims,description	4	0.000				
acrylic acid derivatives	abstract,description	3	0.000				

Show all concepts from the description section

Data provided by IFI CLAIMS Patent Services